U.S. PATENT NO. 5,282,222

	’222 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
1	a wideband frequency division multiplexer for multiplexing the information onto wideband frequency channels	1	a multiplexer for multiplexing the information onto frequency channels with a K and a Δf large enough to be able to achieve a specific throughput and large enough to be able to avoid using either a clock or a carrier recovery device without substantially affecting the BER	**Specification**: claims 1, 7; abstract; figs. 1a, 1b, 5a, 5b, 5c, 13a, 13b, 13c; cols. 1:43–49, 2:13–23, 2:51–64, 3:23–29, 3:39–40, 3:52–61, 4:20–29, 4:44–63, 5:24–39, 5:55–7:46, 12:44–64, 17:11–33, 17:45–18:50 **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action
	wideband frequency division multiplexer	1	a multiplexer for multiplexing the information onto frequency channels with a K and a Δf large enough to be able to achieve a specific throughput and large enough to be able to avoid using either a clock or a carrier recovery device without substantially affecting the BER	**Specification**: claims 1, 7; abstract; figs. 1a, 1b, 5a, 5b, 5c, 13a, 13b, 13c; cols. 1:43–49, 2:13–23, 2:51–64, 3:23–29, 3:39–40, 3:52–61, 4:20–29, 4:44–63, 5:24–39, 5:55–7:46, 12:44–64, 17:11–33, 17:45–18:50 **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action

	’222 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
	wideband frequency channels	1	frequency channels with a K and a Δf large enough to be able to achieve a specific throughput and large enough to be able to avoid using either a clock or a carrier recovery device without substantially affecting the BER	**Specification**: claims 1, 7; abstract; figs. 1a, 1b, 5a, 5b, 5c, 13a, 13b, 13c; cols. 1:43–49, 2:13–23, 2:51–64, 3:23–29, 3:39–40, 3:52–61, 4:20–29, 4:44–63, 5:24–39, 5:55–7:46, 12:44–64, 17:11–33, 17:45–18:50 **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action
2	transceiver / transceivers	1–3, 7–8	transceiver that omits clock recovery, carrier recovery, automatic gain control, passband limiter, power amplifier, an equalizer, and an interleaver-deinterleaver	**Specification**: claims 1–8, 10–11; figs. 1a, 1b, 5a, 5b, 5c, 13a, 13b, 13c; cols. 1:27–37, 1:43–49, 2:13–23, 3:39–40, 3:52–61, 4:20–29, 4:44–63, 9:20–13:64, 17:45–18:50
3	amplitude and phase differential characteristics	1	amplitude and phase characteristics resulting from differential modulation	**Specification**: claim 1; abstract; figs. 2, 5a, 5b, 10, 13a, 13b; cols. 2:51–64, 3:41–43, 3:52–58, 4:9–11, 4:20–26, 5:24–35, 5:65–6:8, 6:30–36, 7:3–46, 9:21–33, 10:26–42, 12:63–13:1, 17:17–27, 17:45–61, 18:22–40; appendix **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action

	’222 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
	amplitude and phase differential	1	difference in amplitude and phase	**Specification**: claim 1; abstract; figs. 2, 5a, 5b, 10, 13a, 13b; cols. 2:51–64, 3:41–43, 3:52–58, 4:9–11, 4:20–26, 5:24–35, 5:65–6:8, 6:30–36, 7:3–46, 9:21–33, 10:26–42, 12:63–13:1, 17:17–27, 17:45–61, 18:22–40; appendix **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action
	differential characteristics	1	characteristics resulting from differential modulation	**Specification**: claim 1; abstract; figs. 2, 5a, 5b, 10, 13a, 13b; cols. 2:51–64, 3:41–43, 3:52–58, 4:9–11, 4:20–26, 5:24–35, 5:65–6:8, 6:30–36, 7:3–46, 9:21–33, 10:26–42, 12:63–13:1, 17:17–27, 17:45–61, 18:22–40; appendix **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action

	’222 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
4	a channel estimator for estimating one or both of the amplitude and the phase differential of the received signals to produce as output one or both of an estimated amplitude and an estimated phase differential respectively	1	a channel estimator for estimating one or both of the amplitude and the phase differential of the received signals to produce as output one or both of the difference in amplitude or phase between received data symbols	**Specification**: claim 1; figs. 7a, 7b, 15; cols. 4:1–4, 4:37–38, 7:17–27, 10:58–12:42, 18:48–50; appendix **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action; Voluntary Amendment **Other Evidence**: U.S. Patent 5,369,670 (PR000237–61) at figs. 2–3, col. 4:4-13, 4:53–61
	channel estimator	1	a device for estimating one or both of the amplitude and the phase differential of the received signals to produce as output one or both of the difference in amplitude or phase between received data symbols	**Specification**: claim 1; figs. 7a, 7b, 15; cols. 4:1–4, 4:37–38, 7:17–27, 10:58–12:42, 18:48–50; appendix **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action; Voluntary Amendment **Other Evidence**: U.S. Patent 5,369,670 (PR000237–61) at figs. 2–3, col. 4:4-13, 4:53–61
5	points	7	divisions within a frame corresponding to one information symbol each	**Specification**: claim 7; figs. 2, 6a, 6b, 10, 14a, 14b; cols. 3:41–43, 3:62–65, 4:9–11, 4:30–33, 5:24–38, 7:28–64, 10:14–57, 17:17–27, 18:25–47; appendix

	’222 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
6	tail slots	7	divisions within a frame that act as a guard band	**Specification**: claim 7; figs. 2, 6a, 6b, 10, 14a, 14b; cols. 3:41–43, 3:62–65, 4:9–11, 4:30–33, 5:24–38, 7:28–64, 10:14–57, 17:17–27, 18:25–47; appendix
7	carrier [recovery]	7	recovery of the carrier signal	**Specification**: claim 7; figs. 1b, 5b, 5c, 13b, 13c; cols. 2:13–23, 3:39–40, 3:55–61, 4:24–29, 4:44–63, 5:55–7:10, 12:45–50, 13:17–28; appendix
8	clock recovery	7	recovery of the clock	**Specification**: claim 7; figs. 1b, 5b, 5c, 13b, 13c; cols. 2:13–23, 3:39–40, 3:55–61, 4:24–29, 4:44–63, 5:55–7:10, 12:45–50, 13:5–16; appendix
9	the second transceiver has a maximum expected clock error χT, where T is the duration of one time domain sample, the information is multiplexed over a number M of levels, and K1 selected such that $2\pi\chi/K1<\pi/M$	7	the second transceiver has a maximum expected clock error χT, where T is the duration of one time domain sample equal to $1/(K_1\Delta f)$, using multilevel differential phase shift keying with M levels to multiplex the information, where K1 is selected such that $2\pi\chi/K1<\pi/M$	**Specification**: claim 7; abstract; figs. 2, 5a, 5b, 10, 13a, 13b; cols. 2:51–64, 3:41–43, 3:52–58, 4:9–11, 4:20–26, 5:24–35, 5:65–6:8, 6:30–36, 7:3–46, 9:21–33, 10:26–42, 12:63–13:1, 17:17–27, 17:45–61, 18:22–40; appendix **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action
	χ	7	a real value that when multiplied by the duration of one time domain sample provides the maximum expected clock error	**Specification**: claim 7; cols. 5:65–6:8

	’222 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
	a number M of levels	7	multilevel differential phase shift keying with M levels	**Specification**: claim 7; abstract; figs. 2, 5a, 5b, 10, 13a, 13b; cols. 2:51–64, 3:41–43, 3:52–58, 4:9–11, 4:20–26, 5:24–35, 5:65–6:8, 6:30–36, 7:3–46, 9:21–33, 10:26–42, 12:63–13:1, 17:17–27, 17:45–61, 18:22–40; appendix **Prosecution History**: Dec. 15, 1992 Office Action; April 19, 1993 Amendment and Response to office action
10	The method of claim 7 in which K2 is selected so that the out of band signal is less than a given level	9	invalid for failure to meet 35 U.S.C. § 112	
	out of band signal	9	invalid for failure to meet 35 U.S.C. § 112 See above.	

U.S. PATENT NO. RE37,802

	’802 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
1	direct sequence spread spectrum code / codes	2, 17–18, 21, 23–24, 30, 33, 36	pseudo random noise sequences over which information bits are spread	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; figs. 1–5, 8–9; abstract; col. 1:20–2:67, 3:12–16, 3:64–4:45, 4:66–5:12; 5:50–6:3 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action **Other Evidence**: Expert testimony of Dr. John G. Proakis John G. Proakis, "Digital Communications" (2d ed. 1989) (PR000147–236) U.S. Patent 6,192,068 (PR000008–42) col. 1:11–28 U.S. Patent 6,320,897 (PR000043–79) col. 1:25–41 Mathews, Gibb, Turner, Graumann, and Fattouche, "An FPGA Implementation of a Matched Filter Detector for Spread Spectrum Communications Systems," University of Calgary (Sept. 1997)

	’802 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
				(PR000095–106) Vijay K. Bhargava et al., "Digital Communications by Satellite: Modulation, Multiple Access and Coding," (1981) (PR000001–07) Tri T. Ha, "Digital Satellite Communications," (2d ed. 1990) (PR000080–87) Andrew F. Inglis, "Electronic Communications Handbook," (1988) (PR000093–94) Raymond L. Pickholz, "Theory of Spread-Spectrum Communications—A Tutorial," IEEE Transactions on Comm. (May 1982) (PR000110–139) Theodore S. Rappaport, "Wireless Communications," (1996) (PR000140–46)
2	first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols	1	The parties agree that this claim element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; abstract; figs. 1–5; cols. 2:5–67, 3:64–4:45, 4:66–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to

	’802 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
			Structure: fig. 1 (item 12), fig. 4 (item 12), and cols. 2:6–10, 2:36–40, 2:58–62, 4:2–12, 4:35–44; LG Electronics cites additional structure: fig. 3 and cols. 2:54–57; 4:29–39; 4:66–5:7.	Office Action; Sep. 1998 Reissue Declaration
	first computing means for operating on the plural sets of N data symbols to produce sets of modulated data symbols corresponding to an invertible randomized spreading of each set of N data symbols over more than one and up to M direct sequence spread spectrum codes	17	The parties agree that this claim element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: operating on the plural sets of N data symbols to produce sets of modulated data symbols corresponding to an invertible randomized spreading of each set of N data symbols over more than one and up to M direct sequence spread spectrum codes **Structure**: fig. 1 (item 12), fig. 4 (item 12), and cols. 2:6–10, 2:36–40, 2:58–62, 4:2–12, 4:35–44; LG Electronics cites additional structure: fig. 3 and cols. 2:54–57; 4:29–39; 4:66–5:7.	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; abstract; figs. 1–5; cols. 2:5–67, 3:64–4:45, 4:66–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action; Sep. 1998 Reissue Declaration
	first computing means for operating on the plural sets of data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols	33	The parties agree that this claim element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: operating on the plural sets of data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; abstract; figs. 1–5; cols. 2:5–67, 3:64–4:45, 4:66–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview

	’802 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
	over more than one and up to M direct sequence spread spectrum codes, where each direct sequence spread spectrum code has M chips		of data symbols over more than one and up to M direct sequence spread spectrum codes, where each direct sequence spread spectrum code has M chips **Structure**: invalid for failure to meet 35 U.S.C. §112, if M does not equal N Alternatively, closest structure: fig. 1 (item 12), fig. 4 (item 12), and cols. 2:6–10, 2:36–40, 2:58–62, 4:2–12, 4:35–44; LG Electronics cites additional structure: fig. 3 and cols. 2:54–57; 4:29–39; 4:66–5:7.	Summary; Feb. 12, 1996 Response to Office Action; Sep. 1998 Reissue Declaration
3	invertible randomized spreading	1, 10, 17, 24–25, 33–34	spreading using an invertible randomized transform LG Electronics’ proposal: spreading using an invertible randomizer transform	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; figs. 1, 3–4, 8; cols. 2:36–40, 2:54–62, 3:13–15, 3:64–4:12, 4:29–43, 4:63–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action **Other Evidence**: U.S. Patent 6,192,068 (PR000008–42) col. 1:11–28 U.S. Patent 6,320,897 (PR000043–79)

	’802 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
				col. 1:25–41
4	a source of more than one and up to M direct sequence spread spectrum codes, where M is the number of chips per direct sequence spread spectrum code	2	invalid for failure to meet 35 U.S.C. § 112, if M does not equal N Alternatively, a source of more than one and up to M direct sequence spread spectrum codes, where M is the number of chips per direct sequence spread spectrum code, where M equals N	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; figs. 1–5, 8–9; abstract; col. 1:20–2:67, 3:12–16, 3:64–4:45, 4:66–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action; Sep. 1998 Reissue Declaration
5	a modulator to modulate each data symbol from each set of data symbols with a code from the up to M direct sequence spread spectrum codes to generate modulated data symbols, and thereby spread each set of data symbols over a separate code	2	invalid for failure to meet 35 U.S.C. § 112	
6	a transformer for operating on each set of N data symbols to generate modulated data symbols as output, the modulated data symbols corresponding to a spreading of each data	4	invalid for failure to meet 35 U.S.C. § 112, if M does not equal N Alternatively, a transformer for operating on each set of N data symbols to generate modulated data symbols as output, the modulated data symbols corresponding to	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; figs. 1–5, 8–9; abstract; col. 1:20–2:67, 3:12–16, 3:64–4:45, 4:66–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response

	'802 Term or Phrase	Claim(s)	Defendants' Proposed Construction	Supporting References
	symbol over a separate code selected from a set of more than one and up to M codes, where M is the number of chips per code		a spreading of each data symbol over a separate code selected from a set of more than one and up to M codes, where M is the number of chips per code and where M equals N	to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action; Sep. 1998 Reissue Declaration
7	second computing means for operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols	10, 17, 34	The parties agree that this claim element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols **Structure**: fig. 2 (item 24) and cols. 2:41–54, 4:21–28	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; abstract; figs. 1–5; cols. 2:5–67, 3:64–4:45, 4:66–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action; Sep. 1998 Reissue Declaration
8	a correlator for correlating each modulated data symbol from the received sequence of modulated data symbols with a code from a set of more than one and up to M codes, where M is the number of chips per code	12	invalid for failure to meet 35 U.S.C. § 112, if M does not equal N Alternatively, a correlator for correlating each modulated data symbol from the received sequence of modulated data symbols with a code from a set of more than one and up to M codes, where M is the number of chips per code and where M equals N	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; abstract; figs. 1–5; cols. 2:5–67, 3:64–4:45, 4:66–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action; Sep. 1998 Reissue Declaration
9	means for receiving a sequence of modulated data symbols, the	10, 34	The parties agree that this claim element should be construed in accordance with 35 U.S.C. § 112(6).	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; abstract; figs. 1–5; cols. 2:5–67, 3:64–4:45, 4:66–5:12

	'802 Term or Phrase	Claim(s)	Defendants' Proposed Construction	Supporting References
	modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols		**Function**: receiving a sequence of modulated data symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols **Structure**: fig. 2 (item 22) and col. 4:18–21	**Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action; Sep. 1998 Reissue Declaration
	means for receiving a sequence of modulated data symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols over more than one and up to M direct sequence spread spectrum codes	17	The parties agree that this claim element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: receiving a sequence of modulated data symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols over more than one and up to M direct sequence spread spectrum codes **Structure**: fig. 2 (item 22) and col. 4:18–21	**Specification**: claims 1–8, 10–13, 17–30, 33–34, 36–37; abstract; figs. 1–5; cols. 2:5–67, 3:64–4:45, 4:66–5:12 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action; Nov. 9, 1995 Office Action; Feb. 9, 1996 Examiner Interview Summary; Feb. 12, 1996 Response to Office Action; Sep. 1998 Reissue Declaration
10	transceiver	1–2, 4–5, 10, 12–14, 17–18, 20–23, 29, 33–34, 36–38	link	**Specification**: claims 1–23, 29, 33–40; cols. 1:66–2:9 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action

	’802 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
11	spreading	1–2, 4, 10, 17–18, 20, 23–25, 33–34	distributing information bits over code chips thereby reducing the effective bandwidth	**Specification**: claims 1, 4, 10, 17, 20, 23–25, 33–34; col. 1:21–64 **Prosecution History**: Mar. 29, 1995 Office Action; Aug. 28, 1995 Response to Office Action
12	a converter for converting the first stream of data symbols into plural sets of N data symbols each	1, 17	This element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: converting the first stream of data symbols into plural sets of N data symbols each **Structure**: fig. 1 (item 10), fig. 4 (item (10), and col. 4:1–2	**Specification**: claims 1, 17, 33; figs. 1, 4; cols. 2:36–40, 2:58–62, 3:64–4:12, 4:40–43 **Other Evidence**: IBM, "Vocabulary for Data Processing, Telecommunications, and Office Systems," (7th ed. 1981) (PR000088–91) Jonar C. Nader, "Dictionary of Computing," (1992) (PR000107–109)
	a converter for converting the first stream of data symbols into plural sets of data symbols each	33	This element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: converting the first stream of data symbols into plural sets of data symbols each **Structure**: fig. 1 (item 10), fig. 4 (item (10), and col. 4:1–2	**Specification**: claims 1, 17, 33; figs. 1, 4; cols. 2:36–40, 2:58–62, 3:64–4:12, 4:40–43 **Other Evidence**: IBM, "Vocabulary for Data Processing, Telecommunications, and Office Systems," (7th ed. 1981) (PR000088–91) Jonar C. Nader, "Dictionary of Computing," (1992) (PR000107–109)
	converter	1, 17, 33	This element should be construed in	

	’802 Term or Phrase	Claim(s)	Defendants’ Proposed Construction	Supporting References
			accordance with 35 U.S.C. § 112(6). See above.	
13	means to combine the modulated data symbols for transmission	1, 4, 17, 33	The parties agree that this claim element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: to combine the modulated data symbols for transmission **Structure**: fig. 1(item 14), fig. 4 (item 14), and col. 4:5–7	**Specification**: claims 1, 4, 14–15, 17, 23, 33, 38–39; figs. 1, 4; cols. 2:36–40, 2:58–62, 3:64–4:12, 4:40–43
14	means to combine output from the second computing means	17	The parties agree that this claim element should be construed in accordance with 35 U.S.C. § 112(6). **Function**: to combine output from the second computing means **Structure**: fig. 2 (parallel-to-serial converter)	**Specification**: figs. 2, 5; col. 2:41–54, 2:58–62
15	combining the modulated data symbols for transmission	23	using a parallel-to-serial converter to combine the modulated data symbols for transmission	**Specification**: claims 1, 4, 14–15, 17, 23, 33, 38–39; figs. 1, 4; cols. 2:36–40, 2:58–62, 3:64–4:12, 4:40–43